

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 13 November 2000 (13.11.00)	
International application No. PCT/GB99/04179	Applicant's or agent's file reference D. BHATOOLAUL 8
International filing date (day/month/year) 10 December 1999 (10.12.99)	Priority date (day/month/year) 18 March 1999 (18.03.99)
Applicant BHATOOLAUL, David, Lahiri et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

16 September 2000 (16.09.00)

☐ in a notice effecting later election filed with the International Bureau on:
2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO  
 34, chemin des Colombettes  
 1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Olivia TEFY

Telephone No.: (41-22) 338.83.38

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>D. BHATOOLAUL 8</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/GB 99/ 04179</b>	International filing date (day/month/year) <b>10/12/1999</b>	(Earliest) Priority Date (day/month/year) <b>18/03/1999</b>
Applicant <b>LUCENT TECHNOLOGIES INC et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

8

☐ None of the figures.

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/04179

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04Q7/32

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 53631 A (MIMURA MASAHIKO ; TOKYO SHIBAURA ELECTRIC CO (JP)) 26 November 1998 (1998-11-26) & EP 0 933 955 A (TOKYO SHIBAURA ELECTRIC CO) paragraph '0012! - paragraph '0019! paragraph '0034! - paragraph '0044! paragraph '0063!; claims 1,5 ----	1-4
X	WO 98 18280 A (ERICSSON TELEFON AB L M) 30 April 1998 (1998-04-30)	1,2
A	page 4, line 1 - line 10 page 5, line 19 - page 6, line 30 page 10, line 6 - page 11, line 21 ----	4
A	US 5 754 541 A (GLISIC SAVO ET AL) 19 May 1998 (1998-05-19) the whole document -----	1-4

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

8 March 2000

Date of mailing of the international search report

14/03/2000

Name and mailing address of the ISA

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Fax: (+31-70) 340-3016

Authorized officer

Coppieters, S

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 99/04179

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9853631	A	26-11-1998	JP 10322760 A CN 1227037 T EP 0933955 A	04-12-1998 25-08-1999 04-08-1999
WO 9818280	A	30-04-1998	AU 4732397 A CN 1234169 A EP 0932996 A	15-05-1998 03-11-1999 04-08-1999
US 5754541	A	19-05-1998	FI 942961 A AU 695305 B AU 2739795 A CN 1130972 A EP 0717913 A WO 9535637 A JP 9505197 T NO 960657 A	21-12-1995 13-08-1998 15-01-1996 11-09-1996 26-06-1996 28-12-1995 20-05-1997 19-04-1996



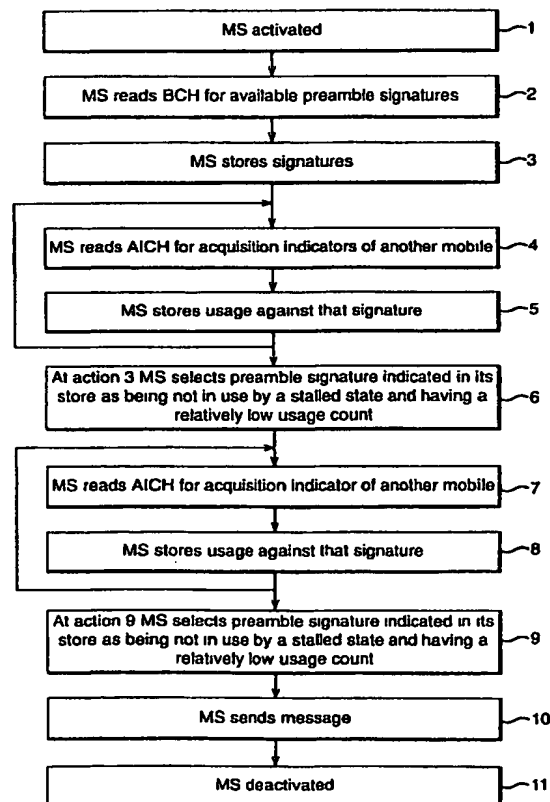
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>7</sup> : <b>H04Q 7/32</b>	<b>A1</b>	(11) International Publication Number: <b>WO 00/56096</b> (43) International Publication Date: 21 September 2000 (21.09.00)
<p>(21) International Application Number: PCT/GB99/04179</p> <p>(22) International Filing Date: 10 December 1999 (10.12.99)</p> <p>(30) Priority Data: 9906198.8 18 March 1999 (18.03.99) GB</p> <p>(71) Applicant (for all designated States except US): LUCENT TECHNOLOGIES INC. [US/US]; 600 Mountain Avenue, Murray Hill, NJ 07974-0636 (US).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): BHATOOLAUL, David, Lahiri [GB/GB]; 16 Ascham Road, Grange Park, Swindon, Wiltshire SN5 6BG (GB). LIM, Seau, Sian [SG/GB]; 17 Union Street, Swindon, Wiltshire SN1 3LD (GB). CAO, Qiang [CN/GB]; 33 Baxter Close, Abbey Meads, Swindon, Wiltshire SN2 3XL (GB).</p> <p>(74) Agents: WILLIAMS, David, J. et al.; Lucent Technologies UK Limited, 5 Mornington Road, Woodford Green, Essex IG8 0TU (GB).</p>	<p>(81) Designated States: AU, BR, CA, CN, ID, IN, JP, KR, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p><b>Published</b> <i>With international search report.</i></p>	

(54) Title: IMPROVED MESSAGE ACCESS FOR RADIO TELECOMMUNICATIONS SYSTEM

## (57) Abstract

A mobile (12) for use in the UMTS is arranged, on activation (1) to read (2) the BCH for all available preamble signatures; to store (3) the signatures in its processor; to read (4) the AICH for acquisition indicators sent to other mobiles; to store (5) usage of other mobiles against each signature; and to select (6 or 9) when required a signature the recorded usage of which is unlikely to cause collisions.



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DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/04179

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 H04Q7/32

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 53631 A (MIMURA MASAHICO ; TOKYO SHIBAURA ELECTRIC CO (JP)) 26 November 1998 (1998-11-26) & EP 0 933 955 A (TOKYO SHIBAURA ELECTRIC CO) paragraph '0012! - paragraph '0019! paragraph '0034! - paragraph '0044! paragraph '0063!; claims 1,5	1-4
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A	page 4, line 1 - line 10 page 5, line 19 - page 6, line 30 page 10, line 6 - page 11, line 21	4
A	US 5 754 541 A (GLISIC SAVO ET AL) 19 May 1998 (1998-05-19) the whole document	1-4

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"Z" document member of the same patent family

Date of the actual completion of the international search

8 March 2000

Date of mailing of the international search report

14/03/2000

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 99/04179

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9853631 A	26-11-1998	JP 10322760 A CN 1227037 T EP 0933955 A	04-12-1998 25-08-1999 04-08-1999
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US 5754541 A	19-05-1998	FI 942961 A AU 695305 B AU 2739795 A CN 1130972 A EP 0717913 A WO 9535637 A JP 9505197 T NO 960657 A	21-12-1995 13-08-1998 15-01-1996 11-09-1996 26-06-1996 28-12-1995 20-05-1997 19-04-1996



# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)





Applicant's or agent's file reference D.BHATOOLAUL 8-21-7		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) <b>FOR FURTHER ACTION</b>	
International application No. PCT/GB99/04179	International filing date (day/month/year) 10/12/1999	Priority date (day/month/year) 18/03/1999	
International Patent Classification (IPC) or national classification and IPC H04Q7/32			
Applicant LUCENT TECHNOLOGIES INC et al.			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.  
  
☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  
  
 These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  16/09/2000	Date of completion of this report  08.06.2001
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Schweitzer, J-C  Telephone No. +49 89 2399 8963  

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/04179

## I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

### Description, pages:

3-5 as originally filed

1,1a,2 as received on 17/02/2001 with letter of 14/02/2001

### Claims, No.:

1-4 as received on 17/02/2001 with letter of 14/02/2001

### Drawings, sheets:

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB99/04179

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims 1 - 4
	No: Claims
Inventive step (IS)	Yes: Claims 1 - 4
	No: Claims
Industrial applicability (IA)	Yes: Claims 1 - 4
	No: Claims

- 2. Citations and explanations  
see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB99/04179

**Concerning section V.2 (reasoned statement under Article 35(2) PCT)**

**Claim 1** relates to a mobile telephone for the UMTS system, which is arranged to transmit during call setup an access request packet to the base station on the random access channel (RACH), said packet comprising a preamble including one of a plurality of available preamble signatures previously obtained by reading the base station's broadcast channel (BCH). Such an use of preamble signatures in access request packets is generally known in the UMTS system and e.g. to be found in the cited prior art reference **D1 = WO-A-98/18280 (Ericsson)**.

To improve the efficiency of signature selection by the mobile it is proposed, in accordance with the characterising features of present claim 1, to monitor the acquisition indication channel (AICH) for acquisition indicators sent to other mobiles and to store usage count by said other mobiles of each signature, so as to select when required a signature the recorded usage of which is unlikely to cause collisions, e.g. from a set of signatures which have a low usage count and are not used by any stalled state.

Such a mobile telephone arrangement as claimed, wherein the knowledge of the usage status for each available preamble signature allows a reduction in the number of unsuccessful preamble detections by the base station, is neither taught, nor rendered obvious, alone or in combination, by the prior art documents cited in the International Search Report.

The cited **WO-A-98/53631 (Tokyo Shibaura Electric)** merely relates to the monitoring of channel occupancies of a plurality of radio frequencies allocated to each of a plurality of base stations, without hint at the monitoring of the AICH channel and the usage of available preamble signatures as claimed.

Claim 1 is therefore novel and considered to involve the required inventive step, Articles 33(2) and (3) PCT. The subject-matter of claim 1 is also industrially applicable.

The same applies to independent claim 4, which is drafted in terms of method steps and correspond essentially to apparatus claim 1. Claim 4, therefore, equally meets all the requirements of Article 33 PCT.

Dependent claims 2 and 3 relate to further implementing details of the method defined by the claim 1 to which they refer and are thus equally novel, inventive and industrially applicable.

**IMPROVED MESSAGE ACCESS FOR  
RADIO TELECOMMUNICATIONS SYSTEM**

REPLACED BY  
ART 34 AMDT

This invention relates to an improved message access arrangement for a radio telecommunications system such as Universal Mobile Telecommunications System (UMTS) and relates especially to the selection of preamble signatures.

During the set up of a call from a mobile telephone to the UMTS system, a mobile needs to select a preamble signature from the available signatures; subsequently, while waiting for an acquisition indication, the mobile may reselect a signature. It may occur that the mobile selects a signature associated with a stalled state, or that collisions occur, and call connection is delayed.

It is an object of the invention to improve the efficiency of signature selection by a mobile.

15 According to the invention a mobile telephone for the universal radio mobile telecommunication system comprises a processor, a transmitter/receiver, and an antenna, characterised in that the processor is arranged, when the mobile is in an active mode to monitor the acquisition indication channel of the UMTS; to store for the duration of the active mode the usage by other mobiles of each available preamble signature; and to select when required a signature the recorded usage of which is  
20 unlikely to cause collisions.

In the accompanying drawings, the prior art is illustrated in figures 1 – 7 in which:-

Figure 1 is a schematic diagram of a part of a radio telecommunications  
25 system;

Figure 2 illustrates a physical random access channel slots structure;

Figure 3 illustrates the structure of a random access transmission;

Figure 4 illustrates the structure of an access burst from a mobile;

Figure 5 illustrates the message part of the random access burst;

30 Figure 6 illustrates the layers involved in message acknowledgement and

Figure 7 illustrates how random access acquisition indication and forward access channels interact to acknowledge preamble and message signals from a mobile.

The invention will be described with reference to Figure 8, which is a flow chart in a mobile system for signature selection.

In Figure 1, a part 10 of the UMTS is illustrated, comprising a plurality of mobile systems (MS) 12, 14, 16 associated with a telecommunications cell controlled by a Base Transceiver Station (BTS) 18 having a Base Station Controller (BSC) 20.

When a mobile such as 12 wishes to make a call, it utilises the Random Access Channel (RACH) of the UMTS which is mapped to the Physical Random Access Channel (PRACH). Transmission in this transport channel is based on the well known slotted Aloha approach, that is, a mobile can start a transmission of the PRACH at any one of a number of well defined time offsets, denoted access slots AS and illustrated in Figure 2. The slots are spaced 1.25 milliseconds apart. Several of the slots in Figure 2 are shown as filled by random access transmissions 30, 32, 34, 36.

Figure 3 illustrates the structure of a Random Access Transmission such as transmission 30; there are several preamble parts 40a, 40b, 40i, each of length 1 millisecond, and an access burst 42 which contains the preamble part, plus a message part of length 10 milliseconds.

Figure 4 shows the structure of the access burst 42. Between a preamble 40j and the message part 44 there is an idle time period of length 0.25 milliseconds. This idle period allows for detection of the preamble part and subsequent online processing of the message part.

Figure 5 shows that the RACH message part 44 consists of a data part 46, corresponding to the uplink Dedicated Physical Data Channel (DPDCH) and a Layer 1 control part 48, corresponding to the uplink Dedicated Physical Control Channel (DPCCH). The data and control parts 46, 48 are transmitted in parallel.

The data part 46 carries Layer 2/Layer 3 messages requesting radio resources or a user packet. The spreading factor of the data part is limited to  $SF_{\{256,128,64,32\}}$  corresponding to channel bit rates of 16, 32, 64 and 128 Kbps respectively. The control part 48 carries pilot bits 50 and rate information 52, using a spreading factor of 256. The rate information indicates a spreading factor of the channelisation code which is used on the data part.

For RACH transmission, the technique of preamble power ramping is used, and the procedure used by a random request has the following actions:-

## CLAIMS

- 1 A mobile telephone for the universal radio mobile telecommunications system  
comprising a processor, a transmitter/receiver, and an antenna, characterised in  
5 that the processor is arranged, when the mobile is in an active mode (1) to  
monitor (2) the acquisition indication channel of the system; to store (3) for the  
duration of the active mode the usage by other mobile telephones of each  
available preamble signature; and to select (6 or 9) when required a signature  
the recorded usage of which is unlikely to cause collisions.
- 10
- 2 A mobile telephone according to Claim 1 in which the processor is arranged to  
store a set of preamble signatures available to the mobile telephone; to indicate  
signatures which are in use by a stalled state; and to indicate for the remaining  
signatures whether the usage count of each signature is relatively low or  
15 relatively high.
- 3 A mobile telephone according to Claim 2 which is arranged to select when  
required a preamble signature which is indicated in its store as having a  
relatively low usage count.
- 20
- 4 In a radio mobile telecommunications system comprising a plurality of mobile  
telephones (12, 14, 16) and a base transceiver station (18) providing an  
acquisition indication channel, a method of operation is characterised by :-  
each active mobile monitoring (2) the acquisition indication channel for  
25 usage by other mobile telephones as available preamble signatures, and storing  
(3) said usage; and  
each mobile selecting when required a signature the recorded usage of  
which is unlikely to cause collisions.